

and

transmitting a prescription of a doctor who inspects the analysis data of the basic data, the assessment data of the desired body data, and the prescription data of the health management device to the health management device via the database server, a network switch, a base station control part and a base station, when suggesting the prescription or updating the memory content of the health management device.

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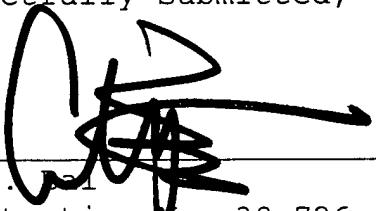
REMARKS

Pursuant to 37 C.F.R. 1.121, the applicant herein submits a substitute specification containing changes and clarifications to the specification. The applicant avers that no new matter has been added by virtue of this substitute specification. In accordance with 37 C.F.R. 1.125(b), a marked up copy of the substitute specification is provided showing the matter being added to and matter being deleted from the specification of record. Further, applicant submits a substitute specification in clean form without markings as to amended material. The Examiner is respectfully requested to enter this substitute specification into the file.

The claims have been amended in order to comport the claims to the substitute specification and to better clarify what the applicant claims as his invention.

Finally, three replacement sheets containing corrected figures are being submitted by separate cover for approval by the Examiner. The applicant avers that no new matter is being introduced by virtue of these replacement sheets.

Respectfully submitted,

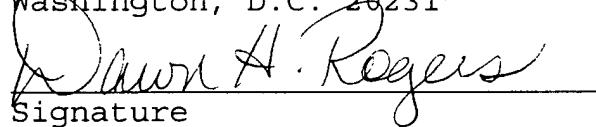
  
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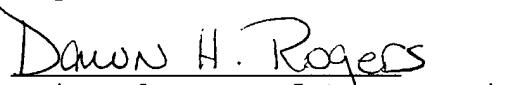
AUGUST 14, 2002  
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**CERTIFICATE OF MAILING**

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# HEALTH CARE SYSTEM AND MANAGEMENT METHOD THEREOF

## BACKGROUND OF THE INVENTION

### (a) Field of the Invention

5 The present invention relates to a health management system and a health management method for a user to effectively control his body weight via a professional doctor's prescription using a health managing apparatus including a data transmitting and receiving device.

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### (b) Description of the Related Art

10 In response to the lifestyle changes and complications of society, various diseases of adult people have been induced and interest in health issues has increased. In particular, interest in people's body weight has become connected to beauty and adult diseases, and various products have been developed to deal with this.

15 However, most related art health management devices simply compute and inform a user of obesity, a normal body weight, an encouraged caloric intake per day for an ideal body weight, or calories consumed in a day, or inform the user of a result [weight change] determined by deducting his caloric consumption from his caloric intake.

20 Therefore, the related art health management devices have problems in that it is impossible to provide information on the way to reach a desired body weight, or consider a personal clinical history or dietary habits.

Further, the related art health management devices have a disadvantage in that it is difficult to effectively control a body weight [since an]

because the encouraged caloric consumption per day with relation to an encouraged caloric intake per day and a predictive total caloric consumption of the day are [is] not suggested.

Furthermore, the related art health [healing] management devices have  
5 the disadvantage in that it is impossible to receive a professional doctor's advice required for body weight control as frequently as desired.

### SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to an apparatus and  
10 method for format converting a video that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

In view of the prior art described above, it is the objective of the present invention to provide a health management device which includes a data transmission and receiving element [,] so that a professional doctor analyzes  
15 personal data such as personal clinic history and dietary habits, caloric intake and caloric consumption, and body data of a user, and that [and] suggests a predictive total caloric consumption of a day and a prescription for encouraged caloric intake and consumption per day as well as content of activity for the caloric consumption by means of the data, and so that the user can input his  
20 food intake and activity contents and receive prescriptions of the doctor at any time.

Another objective of the invention is [It is another object of the invention] to provide a health management system and a health management method which have medical professionalism, mobility and convenience so that adult

diseases due to the lack of nutrients, or worse, caused by inappropriate dietary habits [for] from body weight control, overeating of food and lack of exercise – which may be prevented and beauty may be promoted by controlling body weight and managing health effectively.

5 In order to achieve the above objectives and other advantages, a heath management system and a health management method according to the present invention may provide a professional doctor's prescription for body weight management of the [a] user according to the personal data input by the user such as body data, clinical history, dietary habits, activity degree, caloric 10 intake and activity contents.

According to one aspect of the present invention, a health management device includes an input part, a control part, a memory part and an output part.

The input part is to input basic data of a user.

15 The control part computes an ideal body weight, a body mass index (i.e. body weight / height<sup>2</sup>; kg/m<sup>2</sup>) and a waist / hip circumference ratio on the basis of the basic data for suggesting a prescription by computing an encouraged caloric intake per day, distribution of respective nutrients and an encouraged calorie consumption per day, and suggests the [a] prescription of the [an] amount of one or more food each other and time of activities [activity] on the 20 remaining intake calories and respective nutrients and consumption calories by analyzing the calories and respective nutrients already taken in and consumed by the user by a predetermined time point in a day when a user inputs desired food or activity contents [content].

The memory part stores the input content of the input part and stores software and data required for the processing of the control part.

The output part outputs a result processed by the control part and the basic data.

5 According to another aspect of the present invention, in a health management device including an input part for inputting basic data, a control part for suggesting a prescription on the basis of the basic data, a memory part for storing the basic data and software and data required for the process to be performed by the control part, and an output part for outputting a result of the  
10 process performed by the control part, a health management method includes the steps of inputting basic data, selecting functions, computing a total caloric consumption in a day, computing a total caloric intake in a day, outputting a current body weight status, recognizing a desired body weight, and estimating a  
15 body weight after a predetermined period or a period to reach the desired body weight.

The step of inputting basic data is carried out by storing the basic data input in the input part by a user.

20 The step of selecting functions is carried out by selecting a function to be used by the user from all functions provided and performed by the health management device.

The step of computing total caloric consumption in a day is carried out by performing a function for computing total consumed calories by activity in a day and remaining encouraged caloric consumption on the basis of the basic data.

The step of computing total caloric intake in a day is carried out by computing total calories taken in a day, [and] remaining encouraged caloric intake, and predictive total caloric consumption in a day on the basis of the basic data.

5 The step of outputting a current body weight status is carried out by outputting a current body weight status on the basis of the basic data in the function selected by the user.

The step of recognizing a desired body weight is carried out for suggesting a prescription for a procedure to reach the desired body weight.

10 The step of estimating a body weight change is a step for performing a function for estimating a controllable body weight from the present to a desired period or a period to reach a desired body weight according to whether or not the user selects and inputs the desired period or the desired body weight on the basis of the caloric intake per day and the caloric consumption per day from a 15 predetermined time point in the past to the present.

A health management device includes [In a health management device including] an input part for inputting basic data, a control part for analyzing the basic data and assessing a desired body data on the basis of the basic data, a memory part for storing the basic data and software and data required for the 20 process to be performed by the control part, an output part for outputting a result of the process performed by the control part, a data conversion device and a data transmitting and receiving device, and a health management system includes a network and a database server.

The network is to transmit data output from the health management

device, and the database server is to store the data transmitted via the network for transmitting a prescription of a doctor on the basis of the transmitted data to the health management device via the network.

Wherein, the database server has functions for analyzing the basic data, 5 assessing a desired body data on the basis of the basic data, and transmitting a prescription of a doctor to the health management device.

A health management method according to a first embodiment of the present invention includes the steps of connecting the database server to the health management device via a network, storing analysis data of the basic 10 data and assessment data of the desired body data transmitted from a health management device, and transmitting prescription data of a doctor who inspects the analysis of the basic data and the assessment of the desired body data of the database server by the network.

According to the first embodiment of the present invention, in a health 15 management device including an input part, a control part, a memory part, an output part, a data conversion device and a data transmitting and receiving device, and having functions to transmit basic data and desired body data of a user and to output a prescription of a doctor who receives the basic data and the desired body data, a health management method includes the steps of 20 connecting the database server to the health management device via a network, storing analysis data of the basic data and assessment data of the desired body data transmitted by the health management device in the database server, and transmitting a prescription of a doctor who inspects the analysis data of the basic data and the assessment data of the desired body

data to the health management device via the network.

A health management device includes [In a health management device including] an input part for inputting basic data, a control part for analyzing the basic data and assessing the desired body data, a memory part for storing the 5 basic data and software and data required for the process to be performed by the control part, and an output part for outputting a result of the process performed by the control part, a data conversion data and a wireless transmitting and receiving device. A [a] health management system according to a second embodiment of the present invention includes a base station, a 10 base station control part, a network switch and a database server.

The base station is wirelessly connected to the health management device by using multi-connection communications techniques and protocol to wirelessly connect the health management device to a database server.

The base station control part manages communications frequencies 15 between the health management device and the base station for monitoring and controlling the base station.

The database server stores information on the installation, management and repair, and connection attestation in the wireless communications connection with the health management device, and transmits prescription data 20 of a doctor to the health management device according to the basic data of a user by being connected to the health management device via the base station.

The network switch connects the base station control part to the database server.

[Wherein] The database server may also analyze the basic data of the

user and assess the desired body data on the basis of the basic data instead of the health management device.

In a health management device including an input part, a control part, a memory part, an output part, a data conversion device and a data transmitting and receiving device, and having functions to transmit basic data and desired body data of a user and to output a prescription of a doctor who receives the basic data and the desired body data, a health management method according to a second embodiment of the present invention includes the steps of wirelessly connecting a base station to the health management device by using multi-connection communications techniques and protocol, storing analysis and assessment of the basic data and the desired body data in a database server, and transmitting prescription data of the database server[,] that is[,] the inspected analysis and assessment of the basic data and the desired body data, to the health management device via the database server, a network switch, a base station control part and the base station.

Wherein, in the health management device including an input part, a control part, a memory part, an output part, a data conversion device and a data transmitting and receiving device, and having functions to transmit basic data and desired body data of a user and to output a prescription of a doctor who receives the basic data and the desired body data, the health management method according to the second embodiment of the present invention may include[s] the steps of wirelessly connecting a base station to the health management device by using multi-connection communications techniques and protocol, storing the analysis and assessment of the basic data and the desired

body data in the database server, storing analysis and assessment results of the basic data and the desired body data performed by the database server in the database server, and transmitting prescription data of a doctor who inspects the analysis and assessment results stored in the database server to the health 5 management device via the database server, a network switch, a base station control part and the base station.

Both the foregoing general description and the following Detailed Description are exemplary and are intended to provide further explanation of the invention as claimed.

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#### **BRIEF DESCRIPTION OF THE DRAWINGS**

The accompanying drawings provide a further understanding of the invention and, together with the detailed description, explain the principles of the invention. In the drawings:

15 Fig. 1 is a block diagram of a health management device according to the present invention;

Fig. 2 is a flow chart for explaining a health management method according to the present invention;

20 Fig. 3 is a flow chart for explaining a health management system according to the [a] first embodiment of the present invention;

Fig. 4 is a flow chart for explaining a health management method of the health management system according to the first embodiment of the present invention;

Fig. 5 is a block diagram showing a health management system according to the [a] second embodiment of the present invention; and

Fig. 6 is a flow chart showing a health management method of the health management system according to the second embodiment of the present invention.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

The present invention will be described in detail with reference to the accompanying drawings.

Fig. 1 is a block diagram showing a health management device according to the present invention.

Referring to Fig. 1, a health management system 100 according to the present invention includes an input part 110, a control part 120, a memory part 130 and an output part 140.

The input part 110 is to input personal data of a user, body data, current clinical history and habits, the kind and amount of food taken by the user, and activity contents. The personal data of the user refer to [means] the date of birth and the distinction of sex (including the pregnancy and feeding of females). [and the] The body data refer to [means] height, body weight, waist size, hip size and activity degree regarded as factors for computing an encouraged caloric intake per day according to the routine activity of the user.

The control part 120 provides a caloric intake per day, distribution of nutrients, and an encouraged caloric intake per day, computes an ideal body

weight, a body mass index and a waist / hip circumference ratio on the basis of past and present body data and a desired body data, analyzes a transition of body data of the user, and computes encouraged caloric intake and consumption per day according to the activity of the user.

5       A prescription for the health of the user on the basis of the above includes the amount and kind of food, and time and content of activity for controlling excessive or insufficient calorie amounts.

10      The memory part 130 stores the input content of the input part 110, and software and data required for the process to be performed by the control part 120.

15      The output part 140 outputs contents input by the user, and a result of the process performed by the control part 120 visually and aurally.

20      Fig. 2 is a flow chart showing a health management method according to the present invention.

25      As shown in Fig. 2, a health management method according to the present invention includes the steps of inputting basic data S100, selecting functions S200, computing total calories taken in a day S300, computing total calories consumed in a day S400, recognizing a current body weight S500, recognizing a desired body weight S600, and simulating a future body weight 30 S700.

35      In step S100, a user inputs personal data such as the date of birth and the distinction of sex, the kind and amount of food taken by the user, activity contents per day, body data and current clinical history, pregnancy and nursing status, and dietary habits in the input part 110. [and the] The above data is

stored in a memory part 130.

At this time, the body data indicates past and present body data such as height, weight, waist size, hip size and activity degree together with respective data measuring dates.

5 An amount of activity per day means content and hours of activities taken in a day by the user. In the present invention, the activity content is organized by eating, reading the newspaper[s], talking, driving a car, watching TV, office work and sleeping. [wherein other] Other various activities may be added.

10 In step S200, the user selects a function to use out of various functions provided by the health management device 100.

In step S300, total caloric intake of the user is computed on the basis of the basic data input in step S100, wherein total calories and nutrients taken in a day are analyzed in step S305, and the total calories and nutrients taken in a 15 day and a remaining encouraged caloric intake and nutrients for the day are output in step S310.

If a signal for selecting a function for computing the total caloric intake per day is received by the control part 120 by the selection of the user in step S200, the control part 120 computes the total calories and nutrients taken in a 20 day on the basis of the calories and nutrients taken for a day input in step S100.

In step S400, total calories consumed by activities of the user in a day are computed on the basis of the basic data input in step S100, wherein the total calories consumed a day are analyzed in step S405 and the total calories consumed in a day, [and an] the remaining encouraged caloric consumption of

the day, and a predictive total caloric consumption in a day are output in step S410.

In step S405, the control part 120 receives a signal for selecting a function for computing total caloric consumption in a day by the selection of the user in step S200, and the control part 120 computes the total calories consumed by the user in a day on the basis of the amount of activity undertaken by the user on [in] the day which was input in the basic data input step S100.

That is, as the user inputs the time of each activity in the activity contents, the control part 120 computes the caloric consumption according to each of the activities and hours of the activities in view of the current body weight by using a computation formula stored in the memory part 130.

In step 410, the control part 120 outputs the total caloric consumption and a predictive total caloric consumption in a day computed in step S405 by the output part 140 and the remaining encouraged caloric consumption of the user on the basis of the basic data input in the basic data which was input in step S100 by the output part 140.

In step S500, a current body weight status on the basis of the basic data is output, wherein the basic data is analyzed in step S505 and a prescription for the current body weight is output in step S510.

In step S505, the basic data input in the basic data input step S100 is analyzed with relation to a desired body weight or a desired period according to whether the user inputs the desired body weight or a desired period in the selecting step. On the other hand, the basic data input in the basic data input step S100 is analyzed with relation to the current body weight when the user

does not input either the desired body weight or the desired period. The control part 120 compares and analyzes the desired body weight with the current body weight, or the current body weight with an ideal body weight, for assessing how much the desired body weight or the ideal body weight is achieved.

5        In step S510 for outputting a prescription for the current body weight, the control part 120 determines a lower body weight, a normal body weight, an overweight and obesity by comparing the desired body weight with the current body weight, or the current body weight with the ideal body weight [,]. It also suggests the degree of abdominal obesity [the waist / hip circumference] and  
10      suggests a prescription per day according to the determination, wherein the control part 120 suggests an appropriate way to achieve body weight control according to the determination contents.

Step S600 for recognizing a desired body weight is carried out for suggesting a prescription of the body weight control for the user to reach his  
15      desired body weight for a desired period and includes the steps of setting a desired body weight S605, assessing desired body data S610 and suggesting a prescription with relation to the assessment S615.

In step S605, body data desired by the user is stored in the memory part  
130 via the input part 110.

20        In step S610, the desired body data input in step S605 is compared with the current basic body data input in step S100 for assessing a current status.

In step S615, the control part 120 analyzes various factors such as current body weight, the degrees of obesity and abdominal obesity [obesity, waist / hip circumference], personal clinical history, habits, etc. and suggests

the way for controlling his body weight, that is, the appropriate speed of [the] body weight control, caloric intake per day, increase or decrease of calories, caloric consumption per day, encouragement or limitation of intake food, encouraged activity names, etc. by the output part 140.

5        In the future body weight simulation step S700, a body weight of the user or a controllable body weight of the user after a predetermined period from the present, or a period to reach the desired body weight from the current body weight is estimated on the basis of the caloric intake and consumption per day, or the body weight change from a predetermined time point in the past to the 10 present. The future body weight simulation step S700 includes the steps of selecting either designation of a desired value (a desired period or a desired body weight) or not in step S710, selecting either an estimated period or an estimated body weight in step S715, inputting an estimated period in step S720, inputting an estimated body weight in step S725, performing a first simulation in 15 step S730, performing a second simulation in step S735, selecting either a desired period or a desired body weight in step S740, inputting a desired period in step S745, inputting a desired body weight in step S750, performing a third simulation in step S755, and performing a fourth simulation in step S760.

20        The step S710 for selecting either designation of a desired value (a desired period or a desired body weight) or not is carried out for determining whether to set a basis for the estimation of the controllable body weight range of the user in the future with a desired period or body weight, or dietary habits from the past to the present.

The step S715 for selecting either an estimation period or an estimation

body weight is carried out for determining whether to set a basis for the estimation of the future body data with a period or a body weight.

The first simulation is performed in step S730 in response to the input of a period by the user in step S720, while the second simulation is performed in 5 step S735 in response to the input of a body weight by the user in step S725[.].

The step S740 for selecting either a desired period or a desired body weight is carried out for determining whether to set a basis of estimation of future body data with a desired period or a desired body weight.

The third simulation is performed in step S755 in response to the input 10 of a desired period by the user in step S745, while the fourth simulation is performed in step S760 in response to the input of a desired body weight by the user in step S750.

In the first simulation step S730, the control part 120 outputs an estimated body weight value on the basis of the caloric intake and consumption 15 per day or the change of the body weight from a predetermined time point in the past to the present[,] as the user inputs an estimated period in step S720.

In the second simulation step S735, the control part 120 outputs an estimated period on the basis of the caloric intake and consumption per day or the change of the body weight from a predetermined time point in the past to 20 the present, as the user inputs an estimated body weight in step S725.

In the third simulation step S755, the control part outputs a controllable body weight from the present to a desired period, as the user inputs the desired period in step S745.

In the fourth simulation step S760, the control part outputs a period to

reach a desired body weight in the present state, as the user inputs the desired body weight in step S750.

Fig. 3 shows a health management system according to the [a] first embodiment of the present invention.

5 As shown in Fig. 3, a health management system according to the [a] first embodiment of the present invention includes a health management device 100', a database server 300 and a network 310.

10 The health management device 100' includes the components of the health management system 100 as shown in Fig. 1, and performs the basic function thereof. The health management device 100' may be connected to a database server 300 by a data converting device (not shown) and a data transmitting and receiving device (not shown).

15 The database server 300 stores data required for suggesting a prescription revised by a doctor of the user, and is connected to the health management device 100' by a network 310 for transmitting the prescription which is suggested by the doctor appropriately for the characteristics of the user on the basis of the basic data of the user transmitted by the health management device 100' to the health management device 100' by the network 310.

20 If any new items are generated, the database server 300 transmits the new items to the health management device 100' for the update of the memory content of the health management device 100'.

The network 310 connects the health management device 100' to the database server 300 and performs arbitration of the data transmission between the health management device 100' and the database server 300.

Fig. 4 is a flow chart for explaining a health management method according to the health management system of the first embodiment of the present invention.

As shown in Fig. 4, the health management method of the health management system according to the first embodiment of the present invention includes the steps of connecting the network in step S805, storing data of the health management device in the database server in step S810, and transmitting a prescription of a doctor to the health management device in step S820.

In the network connection step S805, the health management device 100' is connected to the database server 300 by the network 310.

In the database storing step S810, the analysis data of the basic data and assessment data of the desired body data of the health management device are stored not only in the memory part of the health management device 100' but also in the database server 300 for the inspection of a doctor in charge 15 of the user.

In the prescription suggestion step S815, the doctor suggests a prescription appropriate for the characteristics of the user after inspecting the user's clinical history, dietary habits and degree to how much the user reaches 20 the desired body by reviewing the analysis data of the basic data and the assessment data of the desired body data of the health management device. As the suggested prescription of the doctor is stored in the database server 300, the database server 300 transmits the suggested prescription of the doctor to the health management device 100' by the network 310, so that the memory

content of the health management device 100' is updated.

In the prescription output step S820, the health management device 100', having received the doctors prescription, outputs a basic prescription stored in the memory part of the health management device 100' and the 5 prescription received from the doctor simultaneously.

Fig. 5 is a block diagram showing a health management system according to a second embodiment of the present invention. As shown in Fig. 5, the health management system according to the second embodiment of the present invention includes a health management device 100", a base station 10, 510, a base station control part 530, a network switch 550 and a database server 570.

The health management device 100" includes the components of the health management system 100 as shown in Fig. 1, and performs the basic function thereof. The health management device 100" further includes a data 15 converting device (not shown) and a wireless data transmitting and receiving device (not shown) and may be connected to the database server by the base station 510, the base station control part 530, and the network switch 570.

The base station 510 is wirelessly connected to the health management device 100" using multi-connection communications techniques such as CDMA 20 and TDMA, or a protocol to wirelessly connect the health management device to the database server.

The base station control part 530 manages communications frequencies between the health management device 100" and the base station 510 for monitoring and controlling the base station.

The database server 570 stores information on the installation, management and repair, connection attestation, fee calculation and other problems in the wireless communications connection with the health management device 100", and transmits prescription data of a doctor to the 5 health management device 100" on the basis of the basic data of a user by being connected to the health management device 100" via the base station 510. Further, if any new items are generated, the database server 570 transmits the new items via the base station 510 for updating the memory content of the health management device 100".

10 The network switch 550 connects the base station control part 530 to the database server 570.

Fig. 6 is a flow chart for explaining a health management method of the health management system according to the second embodiment of the present invention.

15 As shown in Fig 6, the health management method of the health management system according to the second embodiment of the present invention includes the steps of connecting a base station to the health management device in step S905, storing data of the health management device to the database server in step S910, suggesting a doctor's prescription 20 in step S915, and outputting prescriptions in step S920.

In the connecting step S905, the health management device 100" is connected to the base station wirelessly by using multi-connection communications techniques such as CDMA or TDMA and protocols.

In the data storing step S910, the analysis and assessment of the basic

data and the desired body data of the health management device 100" is stored not only in the memory part of the health management device 100" but also in the database server 570 for the inspection of a doctor in charge of the user.

In the prescription suggestion step S915, the doctor suggests a 5 prescription appropriate for the characteristics of the user after inspecting the user's clinical history, dietary habits and the degree to how much the user reaches the desired body by reviewing the analysis data of the basic data and the assessment data of the desired body data of the database server 570. As the suggested prescription of the doctor is stored in the database server 570, 10 the database server 570 transmits the suggested prescription of the doctor to the health management device 100" by the network switch 550, the base station control part 530 and the base station 510, so that the memory content of the health management device 100" is updated.

In the prescriptions output step S920, the health management device 15 100" that received the doctor's prescription outputs a basic prescription stored in the memory part of the health management device 100" and the received prescription of the doctor simultaneously.

As described hereinabove, the health management system and the 20 health management method according to the present invention may provide a doctor's prescription according to the basic data of the user.

As described hereinabove, according to the health management system of the present invention, the prescription of a professional doctor is always available. Further, the health management system is convenient for body weight control and health management. Therefore, not only obese people but also

people with a normal body weight condition may be protected from diseases of adults brought upon them through lack of nutrients, or worse, due to inappropriate dietary habits. Rather, they may be protected with [by] proper dietary habits and body weight control provided by the health management system of the present invention. For example, [a] hypertensive may be protected from [the] overeating [of] salt or cholesterol related diseases, or [to] the hardening of the arteries and [a] diabetes [diabetic] may be protected from various complications [, since] because the caloric intake per day and an amount of exercise may be suggested for the sake of the blood sugar level.

10 It will be apparent to those skilled in the art that various modifications and variations can be made to the system and method of the present invention without departing from the spirit and scope of the invention. The present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.



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FIG.1

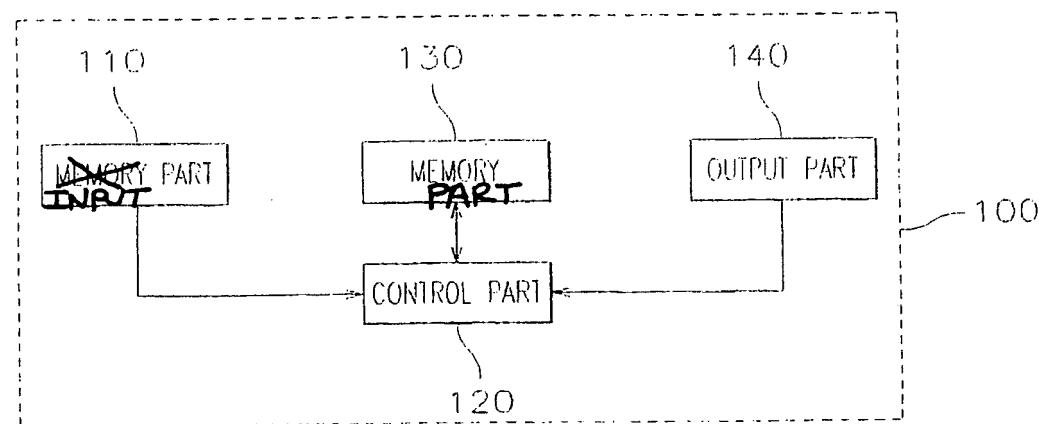


FIG.3

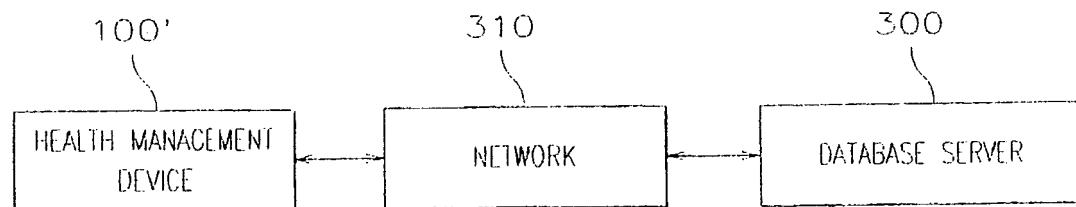


FIG.4

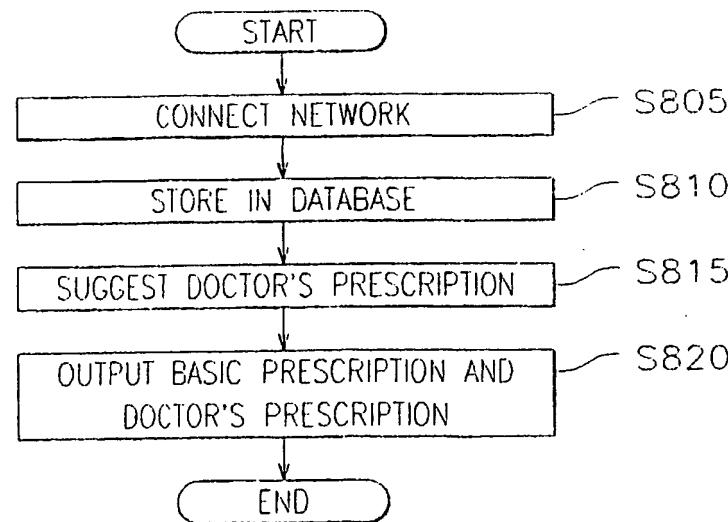
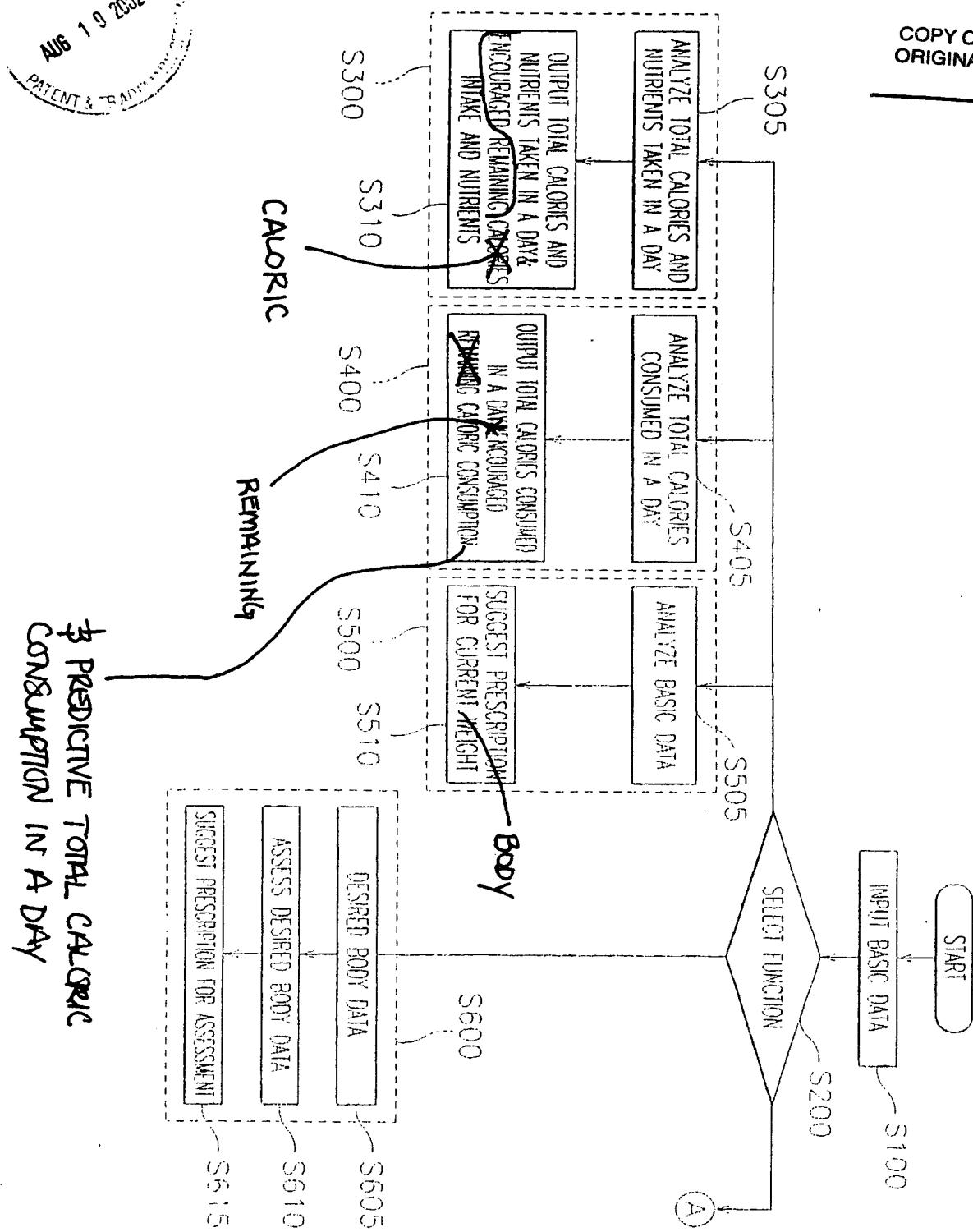
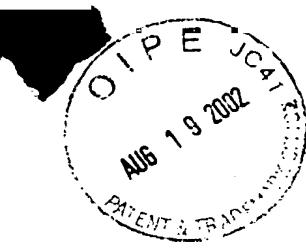


FIG. 2A



b/2



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FIG. 2B

VALUE (A DESIRED PERIOD OR A DESIRED  
BODY WEIGHT)

4/4

